Standard C-2: Students will demonstrate an understanding of atomic structure and nuclear processes.

Content Support Websites

Chemistry Coach
http://www.chemistrycoach.com
High school web site that provides information on all aspects of chemistry. It also has links to other sites .
Deals with all of standard C-2

Periodic Trends
http://chemistry.about.com/library/weekly/aa071802a.htm
Presentation on Periodic Table and its characteristics. This site was developed by two high school chemistry teachers.
C-2.3

Orbital Notation
http://id.mind.net/~nmhschem/QMNotes.htm
Review of Quantum Mechanics. It includes rules for describing electron arrangement.
C-2.1

Electron Affinity
www.webelements.com/webelements/properties/text/definitions/electron-affinity.html
This site explains what electron affinity is and looks at the factors that affect its size.
C-2.2, C-2.3

Ionization Energy
www.shodor.org/chemviz/ionization/students/background.html
This site provides a good description of ionization energy and how it relates to the Periodic Table. Good graphics are provided.
C-2.2 and C.2.3

Fusion and Fission
www.focusfusion.org
This site provides a detailed comparison between fusion and fission. It also provides links to other sites dealing with these two chemical reactions.
C-2.4

Carbon Dating
http://science.howstuffworks.com/carbon-14.htm
This site introduces carbon dating and how it works. It also enables students to see how carbon-14 is made and how it is used to date the age of a fossil.
C-2.5 and C-2.7

Alpha, Beta and Gamma Rays
http://en.wikipedia.org/wiki/Gamma_rays
Several ideas concerning nuclear reactions are presented at this site. These include descriptions of alpha, beta and gamma rays. Information on half-life and carbon dating are also presented at this site.
C-2.5 and C-2.6

E=mc2
www.aip.org/history/einstein.enc1/htm
This site provides a historical background to Einstein and his development of the world's most famous formula C-2.9

Suggested Literature

Asimov, Isaac; Building Blocks of the Universe, Abelard-Schuman, Ltd. 1997
ISBN:0200710990
This book provides a brief discussion of 105 chemical elements detailing structure, forms and uses.
C-2.1

Silverman, Ken; The Radioactive Boy Scout: The Freightening True Story of a Whiz Kid and His Homemade Nuclear Reactor. Villard. 2005
IBSN:0812966600
This is the true story of a Boy Scout who built a crude nuclear reactor in his backyard and his troubles with the Federal Government,.
C-2.4

Housecroft, Catherine E.; Inorganic Chemistry. Person Prentice Hall. 2004
ISBN: 0131399268
A textbook dealing with all facets of inorganic chemistry. In-depth description of atoms, the Periodic Table and atomic trends (including electron configuration, ionization energy, electron affinity, atomic size and ionize size).
C-2.2, C-2.3

Peat, I. David; Cold Fusion: The Making of a Scientific Controversy. Contemporary Books. 1990.
ISBN: 0809240858
This book presents the history of cold fusion including the political and social impact of energy technology development.
C-2.4

Szasz, Ferene Morton; The Day the Sun Rose Twice: The Story of the Trinity Site Nuclear Explosion. University of New Mexico Press. 1995.
ISBN: 082630768X
This book describes the scientific processes that led to the detonation of the first atomic bomb. It presents not only the scientific and historical background, but also the political fall out world wide for the United States.
C-2.4, C-2.5, C-2.8, and C-2.9

Bodanis, David; E=mc2: A Biography of the World's Most Famous Equation. Pan MacMillan. 2005.
IBSN: 0330391658
Historical background to the formation of the famous equation. It also goes into the relationship with the Manhattan Project.
C-2.9

Cotton,F. Albert, Wilkinson, Geoffrey and Gause, Paul L.; Basic Inorganic Chemistry. John Wiley &Sons.1994.
ISBN: 0471505323
This book has sections which deal with atomic orbital, electronegativity and new approaches to the depiction of ionic structure.
C-2.1

Winter, Mark S.; Foundations of Inorganic Chemistry. Oxford University Press. 2001.
ISBN: 0198792883
Sections of this textbook describes s, p and d block elements.
C-2.1

Suggested Streamline Video Resources

Elements of Chemistry: The Building Blocks of Matter
ETV Streamline SC
Students explore the structure of atoms, isotopes and ions. The basic ideas of the Quantum Theory are introduced.
The entire video is 20 minutes in length.
C-2.1 and C-2.2

Elements of Chemistry: The Periodic Table
ETV Streamline SC
The Periodic Table is explained. This includes the placement of the elements on the table and an explanation of the contents of the squares on the table.
C-2.3

Simple Science: Discovering the Elements.
ETV Streamline SC
Quick review of the background to the Periodic Table. It shows how the elements are organized in the table and a historical background as to the reasons Mendeleev set up the table as he did. C-2.3

Chemistry Connections: Nuclear Changes
ETV Streamline SC
This video traces the discovery of radioactivity on to the development of the fission bomb. It also explains the conversion of mass to energy using Einstein's equation.
C-2.4 and C-2.9

Careers in Chemistry

Nuclear Technician
These workers operate nuclear research equipment, monitor radiation and assist nuclear engineers and physicists in research. An associate degree is required for this career.
C-2.4, C-2.5, C-2.8

Chemical Engineer
Persons in this field apply the principles of chemistry and engineering to solve problems involving the production and use of chemicals. They build a bridge between science and manufacturing. A BS degree in Chemical Engineering is necessary for this occupation C-2.1 through C-2.9

Radiologic Technologist
These individuals take x-rays and administer radioactive materials to patients for diagnostic purposes. Some specialize in computerized topography and magnetic resonance imaging. An associate degree is necessary for this occupation.
C-2.5

Chemical Technician
Individuals who chose this field conduct chemical and physical qualitative and quantitative analysis of solids, liquids and gaseous materials for purposes such as research and development of new products.
C-2.1 through-2.3

Pharmacy Technician
These individuals prepare medications under the direction of a pharmacist. They may measure, mix, count out, label and record amounts and dosages of medications. An associate degree is required.
C-2.1 through C-2.3